An Inside Look at How Auditors in Canada Are Using Data Analytics

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Executive Summary

Background Information

CPA Canada's Audit Data Analytics Committee (ADA Committee) has undertaken an initiative to obtain and communicate insights from external auditors who have started to use Audit Data Analytics (ADAs). Such use is an important advancement in audit innovation since it has the potential to enhance the relevance and value of the financial statement audit. Auditors who have not yet started to use ADAs may benefit from, and be encouraged by, the experiences of those auditors who have already taken this important first step.

The participants in this initiative came from nine public accounting firms ranging in size from very small to very large. The participants included representatives from 11 financial statement audit engagement teams and one additional firm's national office and global team who discussed their use of ADAs with representatives from CPA Canada.

Nature of ADAs Used

There were 16 different automated audit procedures identified by participants as being ADAs. The procedures used by more than one participant are noted below; the number of users is noted in brackets:

- journal entry analysis (8)

- process mapping using transaction logs (3)

- two- and three-way matches of aspects of one or more transaction streams (3)

- general ledger account balance analysis (3)

- general ledger continuity analysis (trial balance completeness test) (3)

- scanning for data populations for various attributes (e.g., large items, duplicates) (3)

- aging analysis (e.g., accounts receivable, accounts payable, loans receivable) (2)

- churn analysis (e.g., analysis of changes in numbers of customers and the amounts they owe; changes in types, prices and quantities of inventory items) (2)

Other engagement teams may have used the types of analysis noted above but not considered them to be ADAs. There are differing views among auditors regarding whether particular types of automated audit procedures performed were considered to be ADAs. This report reflects the views of the individual participants in the project.

Overall Purposes for Using ADAs

Virtually all participants used ADAs as risk assessment procedures (i.e., procedures to help identify and assess risks of material misstatement of the financial statements). In some cases, the same ADA was used as a risk assessment procedure and as a substantive procedure to detect misstatements due to fraud or error. In those cases, most of the ADAs were intended to provide audit evidence to supplement that obtained from other substantive procedures (i.e., the ADAs were not considered to be a primary source of audit evidence).

Benefits of Using ADAs

All participants said their primary objective for using ADAs was to improve the quality of audit evidence obtained to support the auditor's opinion. Improved audit efficiency, while desirable, was not their main objective. Some specific benefits identified by participants included the following:

- ADAs improve identification and assessment of risks of material misstatement and contribute to the performance of substantive procedures when the data volume is large.

- ADAs provide management with useful insights as a by-product of the audit since they may involve looking at entire data populations.

- ADAs provide the audit committee with useful insights from the audit while meeting stakeholder expectations.

Challenges in Using ADAs and Related Successes

Participants identified a number of significant challenges to using ADAs; some participants had success (or at least partial success) in meeting these challenges. Examples of challenges and related successes include the following:

- **Establishing ADAs as a replacement for traditional audit procedures**
  Participants noted that this challenge results, for example, from lack of experience in using ADAs and the absence of auditing standards directed specifically at the use of ADAs. Regarding successes in overcoming this challenge, some participants noted that experience gained in using ADAs in the audit of the previous year significantly helped

implement the ADAs in the current year's audit. However, the vast majority of partici-
pants indicated they have not yet used ADAs to replace traditional audit procedures
but are optimistic about being able to do so in the future.

- **Establishing that ADAs are at least as efficient and effective as traditional audit procedures**
  A common challenge noted by participants was difficulty in extracting data with appro-
  priate form and content from the entity's information system. The process of extraction
  may be complex and take a substantial amount of time. Some participants were able to
  overcome this challenge by testing smaller sample sets of data in advance and learning
  from past experiences.

- **Obtaining the support of entity management and the audit committee regarding the use of ADAs**
  Management is sometimes concerned using ADAs may cost more. On the other hand,
  examples were cited where support for the use of ADAs by management and the audit
  committee increased when such use provided detailed insights on matters relevant to
  the entity's operations.

Suggestions for First-Time Users of ADAs

Participants provided suggestions to help first-time users of ADAs, including 10 steps to
follow when first implementing ADAs. A significant theme underlying these steps is that
first-time users should be proactive but have realistic expectations. Also, clear communi-
cation between engagement team members and management is needed throughout the
process of planning, performing and evaluating the results of ADAs.

Future Plans Regarding Use of ADAs

Based on the results of this initiative, it is clear the use of ADAs is not widespread. However,
firms and practitioners are clearly obtaining the skills needed to perform ADAs and building
advanced ADAs that can execute enhanced risk assessments and carry out substantive pro-
cedures. The real challenge remains in extracting the data — both the right data for the ADA
and in the right format for the tool being used. This is further complicated when an entity
has more than one ERP system or a customized ERP system. Time and effort are required
by both the auditor and members of entity management to progress the use of ADAs.

Virtually all participants expressed a strong commitment to continue improving how they
use ADAs and to expand such use. This commitment includes, for example, using ADAs in
performing substantive procedures intended to be a primary source of audit evidence and
as tests of controls. Participants expressed optimism that significant progress will be made;
however, they also acknowledged that there is still much to learn about how to make more

widespread use of ADAs. In addition, some noted a need for changes in auditing standards to address the use of ADAs specifically and for a transparent conversation with audit regulators about their views of such use.

Call to Action

We believe use of ADAs will be a key factor in enhancing the relevance and value of the financial statement audit and in continuing to improve audit quality. Auditors are encouraged to use what they learn from this report to move the dial with respect to ADA implementation in their own engagements, at their firm, and in Canada more broadly.

Specifically, auditors, regardless of their firm size, are encouraged to:

*   continue learning about ADAs

*   ensure they (or their team members) have the appropriate skills/training to execute ADAs

*   start using ADAs in their audit engagements today (if they are not already doing so) and/or continue to push the boundaries in exploring new ways of using ADAs

*   identify and speak up about challenges encountered when using ADAs in the financial statement audit.

Acknowledgments

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Background Information

Purpose of This Publication

Why and how are Canadian auditors using audit data analytics? Has such use been effective? How are client management and audit committees reacting to such use? These are some of the matters explored in a recent initiative undertaken by CPA Canada's ADA Committee.

Objectives of This Initiative

The primary objective of this initiative is to help empower auditors to plan and integrate the use of ADAs into their audits. To achieve this objective, efforts have been made to:

- obtain and communicate information on why and how some auditors in Canada are using ADAs in their financial statement audits and the results of such use

- identify and make auditors aware of important matters to consider in deciding the nature, timing and extent of their use of ADAs going forward

- build on previous initiatives undertaken by CPA Canada regarding the use of ADAs.

The environment in which audits are being performed is characterized by pervasive use of information technology (IT) and increased availability of vast amounts of data. Entities of all types and sizes are making more use of IT-based data analytic tools and techniques. A fundamental issue now being addressed by the auditing profession is how best to keep pace with this changing environment to help ensure that high quality financial statement audits remain relevant and valued in the marketplace.

There is a number of previous Canadian initiatives regarding ADAs. For example, in 2016, the ADA Committee conducted a survey to obtain initial information on the nature and extent of ADAs by Canadian auditors. The results of that survey are available at **ADA Survey—2016**. Also, at the October 2017 UWCISA[1] Symposium, there was a panel discussion on the current use of ADAs and how such use is likely to change in the future. The panelists included two members of the ADA Committee, a member of the Canadian Auditing and Assurance Standards Board, and an academic. Key matters noted during the discussion can be found at **UWCISA ADA Panel—2017**.

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1   The University of Waterloo Centre for Information Integrity and Information Systems Assurance.

This project built on these and other initiatives but took a different approach. A number of engagement teams from various public accounting firms agreed to provide information on how they used ADAs in specific audit engagements, including their views on the related benefits and challenges. Specifically, the project was focused on engagement teams using ADAs for the first or second time on particular audits. This report includes examples from these audits along with suggestions for first-time users. This information may help encourage auditors who are not currently exploring the use of ADAs to do so.

Views Expressed in This Report

The views expressed in this report are those of the project participants. These views do not necessarily reflect those of the ADA Committee or CPA Canada.

Further, the views expressed may not necessarily reflect those of a wide spectrum of auditors in Canada. As indicated by the CPA Canada ADA Survey in 2016, some Canadian auditors use advanced statistical analyses (e.g., linear and logistic regression and cluster analysis), optimization and text mining. There was no expectation, however, that any of the engagement teams would be using complex ADAs. Therefore, the views of participants in this study may not necessarily reflect those of auditors who have more experience in using ADAs.

In addition, not every participant provided views on every topic.

Participant Summary and Process Followed

The identities of the audited entities and the firms who performed each audit have been kept confidential, as agreed with the participants. The audit engagements were completed in 2017 or 2018. **Exhibit 1** summarizes the sizes and types of entities whose financial statements were audited and the sizes of the firms whose engagement teams performed the audits.

> Throughout the remaining sections of this report, the numbers/letters in brackets identify the teams or firms noted in Exhibit 1.

The **Appendix** sets out key aspects of the process, including, for example, project design, recruitment of participants and interviews conducted with them.

EXHIBIT 1: PARTICIPANT SUMMARY

Audit No.	Description of Audited Entities	Audit Firms and Sizes
Large Public Companies (Annual Revenue > $1 billion)		
1.	Manufacturer	Firm A–Large
2.	Wholesaler	Firm B–Large
3.	Manufacturer	Firm A–Large
Medium-Size Entities (Annual Revenue $100 million to $999 million)		
4.	Retailer – Private Company	Firm C–Large
5.	Manufacturer – Private Company	Firm D–Large
6.	Equipment and Transport Services Provider – Public Company	Firm C–Large
7.	Government Agency	Firm E–Medium
8.	Credit Union	Firm F–Medium
Small Public Company (Annual Revenue $25 million)		
9.	Manufacturer	Firm G–Large
Micro-Entities (Annual Revenue < $2 million)		
10.	Arts – Not-For-Profit	Firm H–Very small
11.	Housing – Not-For-Profit	Firm H–Very small

Notes:
- Personnel from Firm A's and Firm B's national offices provided input in addition to their engagement teams.
- Personnel from Firm I's (Large) national office and global team provided input but did not discuss a specific engagement; therefore, Firm I is not numbered separately above.

Audits of Micro-Entities

An engagement partner in a small firm agreed to proactively consider the use of ADAs in planning and performing audits of two not-for-profit micro-entities. They focused on whether specific aspects of each audit could use ADAs to improve the effectiveness or efficiency of the audit and concluded ADAs would not help achieve either of those objectives. The key reason for this conclusion was that the volume of transactional and other data was small and could have been readily scanned and assessed using traditional procedures. Further, in their view, there are likely more opportunities to make effective use of ADAs when performing review engagements. For example, use of ADAs is likely to help the practitioner comply with standards related to such engagements. (10, 11)

Given this feedback, none of the matters noted in the remainder of this report relate to audits of micro-entities. Subsequent references to "all participants" exclude the auditor of the micro-entities.

Types and Characteristics of ADAs Used

As a subject matter, audit data analytics has been defined as "the science and art of discovering and analyzing patterns, identifying anomalies, and extracting other useful information in data underlying or related to the subject matter of an audit through analysis, modeling, and visualization for the purpose of planning or performing the audit."[2] Using the power of information technology, an ADA may be used to analyze or test 100% of the items even in large data populations. This audit approach contrasts with, for example, audit sampling where not all items in a population are tested.

All ADAs are automated audit procedures, but not all automated audit procedures (sometimes called Computer Assisted Audit Techniques, or CAATs) are necessarily ADAs. As noted in the **CPA Canada Audit Guide to Audit Data Analytics**, ADAs might be viewed as an evolutionary form of CAATs that, for example, enable the auditor to make more effective use of data visualization techniques and help achieve a broader range of audit objectives.[3]

In this report, if a participant identified an automated audit procedure as being an ADA, it has been described as such; however, other auditors (including other participants) might not necessarily agree with that description.

Set out below in brief is information provided by participants describing 16 automated procedures that at least one participant identified as being an ADA. The identification number of each participant (see **Exhibit 1**) using each ADA described is noted in brackets. The ADAs are listed in order of number of users (ranging from nine users to one).

2   *CPA Canada Guide to Audit Data Analytics*. (Toronto, Chartered Professional Accountants of Canada, 2018), Chapter 1. **https://www.cpacanada.ca/en/business-and-accounting-resources/audit-and-assurance/canadian-auditing-standards-cas/publications/cpa-canada-audit-data-analytics-guide**

3   Ibid.

Journal Entry Analysis (1, 2, 3, 4, 5, 6, 7, 8, 9)

This type of ADA is used to identify journal entries with unusual attributes or combinations of attributes that may indicate a higher risk of material misstatement due to fraud or error or actual misstatements. Attributes that may be unusual include, for example:

- amounts

- frequency or timing of entries

- account pairings

- sources

- identities of persons making entries.

Unusual attributes are often identified by use of visualization (e.g., the use of various colours to highlight entries that warrant follow-up audit work).

All participants used ADAs to test various aspects of journal entries. A journal entry ADA involves obtaining data relating to up to 100% of the entries made in periods relevant to the audit. For example, these might include the fiscal year being audited and the period between the year end and date of the auditor's report. The data is obtained from various fields in database tables or files.

Process Mapping (1, 2, 6)

This type of ADA involves using software to map key aspects of an entity's process by, for example, using transaction logs contained in the entity's systems. It is used to help identify instances when, for example, a step in the process is missing, is out of sequence, or is not appropriately authorized. Examples of process mapping ADA procedures used include:

- mapping of the audited entity's production process to track inventory movements using a project management tool (1)

- mapping of the entity's sales, receivables, receipts processes. (2, 6)

Two- and Three-Way Matches (1, 3, 6)

These types of ADAs involve automated matching of data in particular fields to determine whether the data is consistent. A mismatch indicates a potentially higher risk of material misstatement or, in some cases, an actual misstatement. Examples of the use of this type of ADA are set out below:

Sales-Receivables-Receipts Transaction Stream

- three-way match of shipping documents, invoices and cash receipts (1, 6)

- three-way match of customer orders, shipping documents and invoices. (3, 6)

Purchases-Payables-Payments Transaction Stream

- three-way match among purchase orders, supplier invoices and payments (6)

- two-way match of dates on supplier invoices with dates on purchase orders. (1)

Payroll Transaction Stream

- two-way match of pay earned by employees to amounts paid to employees. (6)

Fixed Asset Additions

- three-way match of costs charged to fixed assets, payments and capitalized labour costs. (6)

General Ledger Account Balance Analysis (4, 5, 6)

This ADA is used to identify significant changes in general ledger (GL) account balances between years and to review correlations between related accounts or to identify unexpected correlations. It includes use of visualization[4] to show changes that may warrant investigation by the auditor and may enable the auditor to drill down to see the detail underlying the accounts. The ADA may also be used to generate visualizations by month showing, for example:

- comparative sales, and composition of assets and liabilities

- sales, cost of sales, gross profits and related percentages.

General Ledger Continuity Analysis (Trial Balance Completeness Test) (4, 5, 8)

This ADA performs functions previously performed manually. For example, this ADA:

1. takes the beginning balances for the year under audit in each account in the trial balance

2. totals the activity (changes) in each account during the year

3. calculates an ending balance for each account

4. compares the calculated ending balances to the entity's GL balances and computes difference to be investigated

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4 The term *visualization* may refer to the use of various types of graphics (for example, charts, scatter diagrams, trend lines), tables, or combinations thereof. (**CPA Canada Guide to Audit Data Analytics**)

5. verifies that the beginning balances agree with the audited balances at the end of the preceding year.

Other Electronic Searches (1, 7, 8)

Data in populations may be searched electronically using, for example, an include/exclude operation. This is sometimes referred to as "scanning." The objective is to identify items with attributes of interest to the auditor. Participants electronically searched:

*   fields in database tables related to purchases, payables and payments transactions and payroll to identify, for example, duplicate purchase orders, blank vendor address fields, duplicates between names and addresses among suppliers and employees (1)

*   payments data to identify duplicate payments to a supplier related to the same purchase (7)

*   transaction streams for items larger than what the auditor considers normal for the entity or otherwise unusual amounts (e.g., withdrawals from an automated teller machine (ATM) where the dollar amount is not a multiple of 20) (8)

*   loans receivable and interest-bearing liabilities for abnormally high or low interest rates. (8)

Aging Analysis (6, 8)

Examples of the use of this type of ADA include identification of:

*   vendors and related balances owing in each aging category (6)

*   loans receivable from customers in each aging category. (8)

Churn Analysis (4, 6)

These types of ADA are used to show how the makeup of populations has changed from the previous year. Examples of the use of this type of ADA include:

*   inventory churn to identify and develop a visualization showing how the composition of inventory (e.g., product types, costs) has changed from the previous year. The table resulting from this ADA shows, for example, inventory line items (i.e., count and value):
    —   new in the current year
    —   common to both the current year and the previous year
    —   deleted from the previous year (4)

*   new Stock Keeping Unit (SKU) analysis comparing the quantities and prices of each SKU at a point in time in the current year with those of the prior year (4)

- customer churn to identify and develop a visualization showing this year's customers and the balances they owe at a point in time in the year compared to the previous year. This ADA identifies:
  - retained customers
  - lost customers
  - new customers (6)
- Vendor churn (similar to the customer churn but focused on vendors). (6)

Benford's Law Analysis (8)

This ADA used software that applied the Benford's Law[5] analysis to the complete transactional details to look for spikes or anomalies in the occurrence of numbers, which may be an indication of fraud. (8)

Computations of Ratios and Comparisons of Data at a Detailed Level (1)

Examples of the use of this type of ADA include:

- comparison of sales to production (using production listings and sales transaction listings) (1)
- gross margin calculations and comparison of inventory cost to indicators of net realizable value (NRV) on a product-by-product basis. (1)

Correlation of Monthly Changes in Account Balances (4)

Examples of the use of this type of ADA include:

- Retail store sales revenue for each month are compared to cash receipts (including receipts from credit card companies) for each month to determine whether differences correlate as expected. A visualization is produced to clearly indicate whether cash receipts closely correlate with sales plus sales taxes. (4)
- Monthly changes in inventory balances, accounts payable and costs of sales are compared to determine whether they correlate as expected. (4)

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5 Benford's Law observes that certain naturally occurring numbers contain a low first numeral more often than would be predicted for a normal distribution.

Customer Demographics (2)

An ADA is used to break down revenue by customer demographic, by invoice and in aggregate for the year. This readily identifies high-value invoices and high volumes of sales to customers. This is useful given the large amount of sales data. The ADA is designed to mirror the audit thought process regarding revenue, including identifying areas where there is a potentially higher risk of fraud. (2)

Interest Income and Expense Analysis (8)

The various types of interest-bearing asset are identified and a weighted average interest rate model is applied to calculate a rate which is then compared to the overall interest rate earned by the entity. A similar analysis is performed for interest-bearing liabilities. (8)

Inventory Price Variance Analysis (4)

This ADA generates a summary that compares the line item unit cost of products for each period to highlight variances out of line with expectations. (4)

Inventory Line Item Analysis (4)

This ADA compares the profile of inventory line items (e.g., brand names, types, quantities, prices) at a point in time in the current year with that of the preceding year to identify, for example, variations in product mix. (4)

Summary Statistics (1)

This type of ADA is used to generate summary statistics (e.g., maximum and minimum amounts in a population and the population mean). In this case, the engagement team calculated summary statistics for inventory costs. (1)

Matters Affecting Use of ADAs

Tools Used

Participants indicated they use a wide variety of software tools, often in combination. These included general business (e.g., spreadsheets, R) and visualization software (e.g., Tableau, QlikView) as well as audit software obtained from external providers (e.g., IDEA, ACL). Large firms (and to some extent medium-sized firms) primarily use their own proprietary audit software tools.

Knowledge, Experience and Capabilities

This section sets out significant matters raised by participants regarding:

- training of personnel
- availability of experts (specialists)[6]
- work allocation, supervision and review
- reactions by partners and staff to use of ADAs
- recruitment of new personnel.

The bulleted examples below are meant to highlight participants' experiences and reflect only the opinions of those interviewed.

Training of Personnel

- All staff receive some training in the use of the firm's audit software, including those aspects which encompass analytics, so they can perform basic analytics. There are "champions" in each office who are available to assist in performing more complex procedures. Experts from the firm are used to extract data and convert it to a format suitable for audit purposes when more complex datasets are involved. Engagement team staff then perform the audit procedures on the formatted data. (Firm A)

- Training on the tools is now embedded in the second-year training for all senior accountants. Specific partners and staff have also had full-day pilot sessions providing more in-depth training in addition to the other courses. Those who have taken this

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6   Firms used the terms "experts" and "specialists" interchangeably. All references to experts or specialists relate to personnel within the firm (i.e., not external experts/specialists).

training are available as a resource to others in their offices. There is now less emphasis on training staff on how to perform sampling. It is anticipated that the plan will be to replace vouching a sample by using an ADA and doing more in-depth work, as appropriate, on notable items. (Firm A)

- The global firm has developed a data analytics handbook showing how ADAs can be used in applying the firm's audit methodology. This guidance:
  — starts with use of ADAs in identifying and assessing risks of material misstatement. These ADAs are not meant to provide assurance; they focus instead on identifying areas of higher risk.
  — identifies audit tests where use of ADAs can enhance the performance of risk assessment procedures, substantive analytical procedures and tests of details.
  — shows different levels of assurance that could be provided. (Firm I)

Availability of Experts (Specialists) in IT or Analytics

- The engagement team had extra resources for this year's audit. The firm's lead data and analytics resource from the national office provided assistance. This person had expertise in IT, ADA and audit. There is a scarcity of resources who possess these combined skill sets. The involvement of this expert had a significant positive effect on the audit. Previously, help was provided by individuals experienced in providing IT advisory services rather than audit. These experts tried to manipulate whatever data they obtained rather than specifying the data needed for audit purposes. This year, the focus of the expert was on auditing. Further, the expert's time was provided free of charge as an investment in ADA; it was not charged to the audit or billed to the client. The audit team will continue to have some expert help for next year's audit. (1)

- Our specialist imported and tied data obtained from the client's ERP system back to ledgers and subledgers to ensure accuracy. The audit team ensured data reconciled to work papers in the audit file. Our specialist was also used to create analytics under the team's direction. (2)

- The firm's ADA experts were used to provide assistance this year in planning and performing the audit. Use of experts was very useful in the first year to support getting the data in the right format. For the 2018 year end audit, there will still be a need for these experts. It is anticipated that experts will continue to be needed for the foreseeable future to extract data from the client ERP system. It is not clear how other members of the engagement team would be able to do that directly. However, once the data is obtained, members of the engagement team can import the data for use with particular tools. (3)

- The firm has a designated person with an IT background who can help the team manipulate certain data with filters and other methods to allow for easier analysis when performing audit procedures. (4)

- Assistance was provided by a national ADA expert. Further assistance will be obtained in the future to integrate use of ADAs more fully into the audit program. (5)

- IT specialists from the national office are available to help when needed. Each of the firm's offices has at least one senior manager who is a designated ADA coach to support engagement teams. The firm also has an ADA Innovation lab that develops new tools, expands the types of ADAs being used and supports teams with data acquisition. (6)

- IT specialists from a large firm (on contract) played a key role in this initial use of ADAs. The auditor's office has one IT specialist on staff. (7)

- The engagement partner has an in-depth knowledge of IT (i.e., a computer science degree and many years of experience auditing in IT environments). Other members of the engagement team have training in use of audit software provided by a vendor. (8)

- National office personnel from the same office as the engagement team were available for immediate consultation regarding the ADA tool being used, that was supplied by an external vendor. (9)

Work Allocation, Supervision and Review

- There was no change in the approach to providing direction and supervision regarding ADAs vs. other audit procedures. There is involvement from all levels of the engagement team, including partner, manager, and the senior staff accountant. The ADAs relate almost exclusively to risk assessment. If issues related to the use of ADAs arise, the team has direct access to resources at the national office. (1)

- The partner and managers determined how and where to use the tools and provide the audit mindset. The staff accountants on the team loaded data and ran applications. Senior staff became involved in dealing with notable items identified. It is not clear whether this will change in future years. There will be more senior time in year one of an audit engagement; going forward, more junior staff will be able to perform more of the work. (2)

- There was no change from previous years regarding the engagement quality control review process. (Firm A)

- The use of ADAs has resulted in more involvement of senior staff on the engagement. (6)

Reaction by Partners and Staff to Use of ADAs

- The reactions of partners and staff to increased use of ADAs have been mixed:
  - Recently recruited staff tend to be more interested in the use of ADAs than staff with many years of audit experience.
  - Audit file reviewers are still getting accustomed to the use of ADAs. As part of their review, they want to be comfortable with what the ADA tool is meant to do and whether it has, in fact, done what it is supposed to do. (2)

- The reaction of engagement team members with respect to moving toward increased use of ADAs is generally positive. Use of ADAs forces all members of the engagement team to think about the audit differently. They realize they cannot just do the same as last year; they need to assess what is required differently each year. (6)

- Younger staff are more comfortable using technology. However, initially, they often do not understand the controls over an IT system. The firm must provide training on these concepts. (8)

- Entry-level staff are generally more willing to experiment and are familiar with the use of software such as Excel. There is more concern about the ability of mature staff to make more use of ADAs. (Firm B)

Recruitment of New Personnel

- New hires do not need to have ADA skills; they are provided with the firm's training courses, including some training in the use of ADAs. The key is to hire smart people and empower them to try new approaches. A lot of this involves trial and error as well as persistence. Would a person really become an expert at using ADAs in school? It is more important to have a combination of critical thinking skills and curiosity. The rest can be taught. (1)

- The firm is hiring more people with science, technology, engineering and mathematics (STEM) backgrounds and providing more training in IT and the use of ADAs. (6)

- There have been no substantial changes in the types of candidate recruited to join the audit practice. (Firm B)

- One approach is to move away from focusing solely on business graduates. New recruits may include mathematicians and data scientists. Recruits may also include those with training in psychology, who understand what motivates people to do what they do (e.g., commit a fraud). However, there are significant issues regarding how best to achieve the appropriate mix of skills. Depending on its size, the firm may, for example, need a statistician or data scientist for each major area of focus, not one for each engagement team. There will likely be no more generalists in the future; everyone will specialize. (Firm I)

Policies of Firms Regarding Use of ADAs

The policies of firms regarding use of ADAs may influence, for example, the rate at which the use of ADAs is adopted. Participating firms varied in the nature and extent of policies implemented to date regarding use of ADAs.

- Two firms now have a policy requiring the use of some form of ADA for audit engagements meeting certain criteria (e.g., public companies that have revenue and audit hours exceeding specified levels). (Firm A, Firm C)

- Some firms have moved toward making ADAs mandatory for at least some aspects of audit engagements. However, there is no expectation ADAs be used on all aspects of an engagement. (Firm B)

Overall Purposes for Which ADAs Are Being Used

Participants discussed their use of ADAs as risk assessment procedures, substantive procedures and tests of controls. Auditors might also use ADAs, for example, as engagement acceptance/continuance procedures or in helping to form an overall conclusion from the audit. However, participants did not refer to use of ADAs for those purposes.

Risk Assessment Procedures

Virtually all engagement teams used ADAs to help identify and assess risks of material misstatement. Exceptions where ADAs were not used for this purpose, or for particular aspects of this purpose, included the following:

- An attempt was made to use ADAs for a substantive procedure without first using the ADAs for risk assessment. In retrospect, the engagement team's view is that in any audit engagement, ADAs should be used to help plan the audit and to identify and assess risks of material misstatement. (7)

- ADAs were not used in planning or performing those aspects of risk assessment relating to updating the auditor's knowledge of the entity and the industry in which it operates. Other procedures not involving ADAs are used to obtain updated knowledge. (8)

Substantive Procedures

Participants used journal entry ADAs both to assess risks of material misstatement due to fraud or error and as substantive procedures to detect such misstatements. For some, the use of ADAs for journal entry testing has become embedded in their audit methodologies, replacing traditional procedures performed in this area. One participant initially did not identify journal entry testing as an ADA because use of this ADA has become the status quo at their firm. This example is seen as a success in the integration of ADAs and a positive step in the evolution of ADA use.

As noted above, most other ADAs were used as risk assessment procedures. In some cases the ADAs provided substantive audit evidence alone or in conjunction with other proce-dures (i.e., ADAs provided evidence to supplement evidence obtained from performing other substantive procedures).

Tests of Controls

None of the participants used ADAs as tests of controls.

- Although guidance on how to use ADAs in tests of controls is available at our firm, there is no proof of concept available currently to support the use of ADAs as tests of controls. It is not clear what the auditor could infer with respect to the design and operating effectiveness of a control when using analytics, as the auditor would normally be evaluating the controls as performed by the entity rather than using analytics to perform a potentially different set of controls which may validate the same activity but in a different way. At this point, this conclusion cannot be made. More applied research is required before auditors will feel comfortable with using ADAs as tests of controls. (Firm B)

Benefits of Using ADAs

All participants stated their primary objective in increasing the use of ADAs is to improve the quality of audit evidence obtained to support the auditor's opinion. Improved audit efficiency, while desirable, is not their main objective.

The benefits discussed with participants are grouped in the following three themes:

1. improve identification and assessment of risks and contribute to performance of substantive procedures

2. provide management with useful insights from the audit

3. meet audit committee expectations while providing useful insights from the audit.

Improve Identification and Assessment of Risks and Contribute to Performance of Substantive Procedures

-   ADAs used to scan various fields in database files related to purchases, payments and payroll provided a better assessment of the overall fraud risk related to segregation of duties. (1)

-   Use of ADAs made it practicable to perform more meaningful comparisons among the company's locations. (1)

-   The ADA to analyze customer demographics provided useful new insights into how the company's customers are transacting with the company. These insights helped to pinpoint significant risks and supported conclusions regarding risks other than significant risks. It would not be practicable to perform such a detailed analysis manually. There are thousands of customers, many of which are small and individually of low risk. (2)

-   ADAs were typically used in aspects of the audit's risk assessment that require more processing power due to large volumes of data. (4)

-   The main benefit was being able to look at populations and trends using visualizations (e.g., changes and trends in cost of sales) in an appropriate amount of detail (e.g., by product type). (5)

-   The accounts receivable churn analysis identified the company's top customers this year as compared to those of the prior year. This ADA also helped to identify new customers in new locations where the company is operating. This helped the team tailor procedures to respond more effectively to identified fraud risks. (6)

- ADAs focusing on revenue and payroll were successfully used in previous audits and worked as planned again this year. The ADAs resulted in the identification of some unusual transactions which required follow up (e.g., incorrect offsetting of an expense against revenue and also some non-monetary transactions). The team is expanding use of ADAs to other areas where there are detailed ADA work programs available (e.g., fixed assets and accounts payable). (6)

- Using an ADA helped to determine quickly whether an unusual item is isolated or pervasive because the complete population was analyzed. (8)

- Use of ADAs has been effective in addressing circumstances when an audited entity is not able to establish (or otherwise has not established) effective segregation of duties (e.g., an ADA has been used to identify payments to employees included in payments to suppliers). The objective was to identify fraudulent payments to employees. A two-way match was used to compare relevant data fields identifying employees with those identifying suppliers (e.g., name, address, bank account to which deposits are made). This type of ADA is popular for use in audits of entities in the municipal, university, schools, hospital (MUSH) sector since these entities are very sensitive to fraud. Also, it may be used in audits of smaller entities that may have ineffective segregation of duties and other aspects of ineffective internal control. (Firm I)

Providing Management with Useful Insights from the Audit[7]

- Management was supportive of the work being done (e.g., there were no concerns expressed by management in response to additional requests for data from the audit team). The audited entity has a decentralized structure. It is a challenge internally for head office management to always get insights at the divisional level. Therefore, management appreciates the visibility that ADAs provide regarding individual divisions. They see value in them, though it takes some back-and-forth over the course of several ADA iterations to figure out what is most relevant to management and provide it in a meaningful way. (1)

- The results of revenue ADAs performed were shared with management:
  - They were quite interested in the results, which provided them with a viewpoint different from that obtained from their Excel spreadsheets. They appreciated the additional identification of insights and trends they could follow up on in more detail.
  - Use of ADAs helped management understand the audit approach, including how onerous it is for the auditor to address such high volumes of data.

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7   A discussion with a member of senior financial management of one of the audited entities confirmed that management benefits from additional insights provided by use of ADAs and specificity in identifying potential issues requiring follow up.

— The ADAs helped to show management the number of manual entries. This increased their awareness of this issue, especially as clients work toward being more automated. (2)

- There were advantages to looking at entire populations of data. Being able to provide client management with detected instances of anomalies, control deficiencies and misstatements is important. This approach provided significantly more convincing evidence to the client management that a problem existed, as compared to providing a statistical extrapolation of an anomaly. (6, 8)

- In determining the nature and extent of ADAs to use for the first time on this particular audit, the team took into account which ADAs were likely to be perceived by client management as adding the most value. Client management had a positive view of the ADA performed to detect duplicate payments to suppliers. A number of such payments was identified and the client was able to recover some of the related amounts. The engagement team was also able to identify control deficiencies that enabled duplicate payments to occur based on the analysis of the root cause of these duplicate payments, which the client was able to correct. (7)

- Management appreciates the use of ADAs to detect anomalies such as loans receivable with abnormally low interest rates, or accounts for which abnormally high interest rates are being paid. (8)

Meeting Audit Committee Expectations While Providing Useful Insights from the Audit

- The audit committee was receptive to expanded use of ADAs. The engagement team decided not to present the results of the ADAs using pictures; instead, they showed the audit committee granular information on matters of interest revealed by using ADAs (e.g., details of unusual transactions). (1)

- The engagement team showed screenshots of revenue ADAs to the audit committee to help explain why some risks of material misstatement were identified and assessed as being significant risks. The ADAs also helped provide an understanding of different areas of revenue. The audit committee sees value in the growing use of ADAs, including visualizations: "A picture is worth 1,000 words." (2)

Challenges in Using ADAs and Related Successes

In this section, when participants have noted some success in addressing challenges, this success is shown in shaded paragraphs.

The challenges discussed with participants are grouped around the following three themes:

1. establishing ADAs as a replacement for traditional audit procedures

2. establishing that ADAs are at least as efficient and effective as traditional audit procedures

3. obtaining the support of entity management and the audit committee regarding the use of ADAs.

Establishing ADAs as a Replacement for Traditional Audit Procedures

Insufficient Experience in Using ADAs

- ADAs are an add-on to existing procedures. In the vast majority of cases, engagement teams do not yet feel they can justify reducing the extent of traditional audit procedures when ADAs are used. There is a firm-wide initiative to use more ADAs on public-company audits. Some audits have been identified for increased use. However, this does not entail replacing the traditional test of details. The national office audit methodology personnel still need more information before decisions can be made on when ADAs can replace rather than supplement other procedures. From the overall firm's perspective, there are only a few procedures specifically endorsed by the audit methodology department. Journal entry testing is one of these procedures. (1)

> ### *Successes in Building on Past Experience*
>
> - ADAs were previously used to a limited extent on this engagement. These included ADAs relating to the audit of inventories and journal entries. This initial experience was positive overall. Use of ADAs has evolved and will continue to do so over a number of years. A big takeaway is that no auditor is going to get it right the first time. This year, the overall objectives for use of ADAs were achieved. The engagement team was able to build on the experience gained from previous use of ADAs. This has put this audit engagement ahead of the curve regarding use of ADAs when compared to most other audits performed by the firm. (1)

- A journal entry ADA used to check the cut-off of sales revenue, accounts receivable, and cash receipts was successful. This cut-off ADA was run in parallel with traditional cut-off procedures this year. No differences in results were noted. Therefore, they are now confident ADAs can replace traditional procedures in auditing cut-off in future years. Manual journal entries related to cut-off will still be audited using traditional procedures (e.g., sampling). (3)

- ADAs have been used in audits of previous years with positive results. For example, the inventory churn ADA has been used successfully for a couple of years now. It is now easy to roll forward and maintain. The results were largely within expectations and management was able to explain any outliers. (4)

- ADAs are still used in conjunction with traditional procedures in particular to test information produced by the entity. In some cases the size of samples has been reduced. (4)

- ADAs have features similar to CAATs that have been used successfully for a number of years on this audit. (8)

- This is the second year ADAs have been used for this engagement. The engagement team now has the experience required to be successful. They had a basis for good expectations regarding what use of ADAs would look like going into this year end. (6)

- The audited entity had made an acquisition which made the use of ADAs more complex due to use of different IT systems. However, without the use of ADAs, more extensive testing would have been required. ADAs reduced the level of interaction required with management to obtain information. The engagement team concluded that the use of ADAs justified reducing the extent of detailed sample testing. There are advantages to looking at entire populations of data. The firm's audit process specifically considers what can go wrong and what the auditor should do to respond, including following up on any exceptions identified. The nature and extent of procedures required in response to an exception are matters of professional judgment. Success in use of ADAs is repeatable when you get it right. (6)

- Two years ago, journal entry testing took 24-30 hours. These hours were required to accumulate the required information and then test a sample of entries. Last year, the engagement team worked with a software provider to use an ADA to audit journal entries. Efficiencies were gained. However, in the initial application, many outliers identified had to be explained (e.g., routine payroll journal entries were initially flagged as unusual). This year these issues were addressed. The total audit time for auditing was six hours of which three involved setting up the software tool. However, the costs of using the software still have to be assessed against the time saved. (9)

Compliance with Auditing Standards

- Visualization software applications such as Tableau, PowerBI and QlikView (among many others) are designed to summarize data, drill into details, and display patterns and trends. In the context of a financial statement audit, these features can be used to discover areas where there may be higher risks of material misstatement by identifying patterns or trends that contradict the auditor's understanding of the entity. This is likely to be a discovery process where the auditor does not have a preconceived notion of what they are looking for, but "they will know it when they see it." While this works well from a risk assessment point of view, CAS 520, *Analytical Procedures*, requires the auditor to establish expectations sufficiently precise to identify a misstatement. Given the auditor may not have a preconceived notion of what they are looking for at the onset of the use of these tools, it is difficult to see how the requirements regarding substantive procedures in CAS 520 can be met. With ADAs involving visualizations, one approach could include a discovery phase that allows the auditor to develop an expectation. However, this process becomes iterative and questionable as to whether it meets the standard. If expectations cannot be created, the procedure becomes incremental to traditional audit procedures. It is not yet clear how to use the data from visualization tools in the context of auditing standards. A key question the standards need to address is how does the auditor take a population and determine that they have identified the outliers and audited the high-risk items. Currently, while it is true to say that auditing standards do not preclude the use of visualization software to provide audit evidence, it is very difficult to reconcile the current requirements of the standards with these tools. (Firm I)

- ADAs are most often being used as a tool to prepare an enhanced risk assessment performed under CAS 315, *Identifying and Assessing the Risks of Material Misstatement through Understanding the Entity and Its Environment*. With the added precision in the risk assessment, we believe the standards need to incorporate the impact of that precision on the nature and extent of testing required under CAS 330, *The Auditor's Responses to Assessed Risks*. (Firm A)

Establishing That ADAs Are at Least as Efficient and Effective as Traditional Audit Procedures

More Time Required by Experts (Specialists) and Senior Staff

- There are increased costs related to having the firm's IT people involved. There is also increased time spent in learning to apply the tools effectively in the context of this audit. (3)

- More hours were spent in year one to set up the use of ADAs for the engagement. There have been changes in the mix of the work (e.g., senior staff or manager involvement in running reports). The team is expected to be more efficient in year two. The team composition will be the same as the prior year. (6)

- Costs have increased because more senior staff are now being used for the audit than was the case a few years ago. However, audit fee issues have never come up with this client. (8)

Difficulties with Data Acquisition

- The initial data request and communication with client personnel was flawed. There was a misunderstanding of what certain data fields contained. It is difficult when the team does not have the right data and needs to pull additional data across all locations. In certain cases, the actual contents of fields in reports differed from what was initially understood/expected; at times, this was discovered too late in the engagement to pull the correct data. Where the correct data was pulled, it needed to be cleansed again for all relevant months and locations. (1)

- Multi-location application of ADAs is difficult because different locations may do things differently; this makes it difficult to run standardized routines to acquire data. (1)

- Obtaining data in a format usable for audit purposes has been a challenge, particularly when client system changes have resulted in the updated system providing less detail than was previously available. It is important to discuss data acquisition issues up front with the client. The engagement team had proposed using the ERP extract functions to obtain data for audit purposes. However, the client did not allow this. Their view was that this would entail management having to engage ERP personnel with specialized expertise. This would be expensive both in terms of cost and time. (4)

- Obtaining access to individual subledgers did not present any issues. However, the volume of data required for the GL analysis was very large. The data had to be obtained quarterly, which took considerable time. If an attempt had been made to provide the auditor with the data all at once, the company's system would have crashed in the process. (5)

- Even with the involvement of experts, many more hours than anticipated were spent obtaining data from the client's ERP system in a format suitable for the audit. About 80% of the time was spent trying to acquire the data in an appropriate format and about 20% on the actual analysis. In the end, for the 2017 audit, ADAs were not used to the extent planned. A key issue for the journal entry ADA was distinguishing the different processes used for automated journal entries (i.e., postings to the GL that are automatically generated by the ERP system) versus "manual" journal entries (i.e., journal entries input by client personnel). The system underlying the automated entries is particularly complex. (7)

- The most significant use of resources is related to accessing data in a format suitable for the audit. The engagement team had the technical skills required; however, the client did not have a clear understanding of the nature and extent of the data required for audit purposes. That issue has since been largely overcome. (7)

> ### *Successes in Overcoming Data Acquisition Issues*
>
> - As a result of data-acquisition issues, the engagement team was unsuccessful in using ADAs to audit revenue last year. This was the only major challenge identified regarding the use of ADAs for this audit. The client uses a modified ERP system for revenue in a number of different currencies. This created difficulties. This year, the engagement team obtained assistance from the firm's ADA software and ADA experts. These experts played an important role in understanding the ERP system and pulling out relevant data. The client's IT personnel worked directly with these experts. As a result, there were no issues with data extraction. (3)
>
> - Data acquisition issues experienced in previous years were addressed. The approach now is to apply the GL reconciliation ADA on a monthly basis. The process is now much faster, resulting in more time being spent on analysis rather than on data acquisition. (4)

Issues in Using Data Acquired

- There are some cost increases, especially when an ADA is first implemented. The timing of ADA performance and the time such performance takes still need to be improved. For example, the time cycle between identification of data requirements, extraction, analysis, testing of outliers and drawing conclusions was much longer than anticipated when preparing to perform the audit. The added time was extra days, not just hours. Ideally, ADAs would be performed in real time, but the engagement team is still very far away from that. (1)

- The engagement team encountered issues regarding the usability of data obtained. The company's ERP system is centralized. However, another company was purchased during the year that did not use the same ERP system. The engagement team could not incorporate the data from the acquired company for the current year's audit. This problem should be resolved next year when systems are integrated. A key matter to consider when using ADAs is that acquisitions during the year can make their use difficult no matter the extent of the auditor's previous experience in using ADAs. (3, 5)

- It was difficult to use ADAs in assessing risks of misstatement in inventories because the company has multiple listings of inventories, each with different attributes (i.e., the fields used to record data vary in content and format). To provide meaningful analysis, the engagement team had to try to amalgamate the various sources of data to feed

into the data analysis process used for the audit. Meeting this challenge requires up-front planning and working first on individual segments of the inventory to identify the "right" data fields from which to access data to be used in the ADAs. (5)

- Acquisition of a new entity by a client may have a significant adverse effect on the auditor's ability to use ADAs effectively because of use of multiple IT systems. (6)

- The engagement team checks, for example, that revenue is not affected by manual journal entries and that accounts receivable are not being reduced by sources other than cash receipts. However, that requires some filtering out of certain types of transactions. For example, in the prior year, the team had identified specific transactions that differed from the main process for recording cash receipts. The auditor needs to obtain a good understanding of which aspects of transactions should correlate. The team had to filter out transactions and related accounts that were not relevant to the ADA being performed. For example, insurance claims receivable and receipts were filtered out since they do not relate to revenue. (6)

Data Reliability

- The firm continues to struggle with where ADAs can be used as substantive procedures to detect misstatements due to error or fraud (i.e., go beyond risk identification and assessment). The main issue is the amount of work required to establish the reliability of data required when using an ADA as a substantive procedure. This is a major hurdle. (2)

- Working with data that is still being changed by the client is difficult. The auditor has to track adjustments made within the data being used for analysis. This might be a greater issue for some audits. Because, for example, smaller clients may sometimes make more adjustments, using interim data may not be practicable. It is not productive to perform a significant amount of work and then find the data cannot be reconciled with the records used to prepare the financial statements. On the positive side, the lack of different input sources for this client helped minimize data acquisition issues. (2)

- The trial balance completeness test performed by the engagement team was often able to identify matters for follow up because journal entries reflected in sub-systems were sometimes not yet reflected in the GL. Therefore, it can be difficult to map the journal entries through the system. Finally, information being used to control operations may be different from that used for financial reporting because of disconnects between aspects of the system. (4)

- Analyzing transactional data on a disaggregated basis can make correcting entries or transactions stand out with the result that they may show up in visualizations as outliers. It is important to take this into consideration and normalize the data to take out the effect of any such corrections. (5)

> ***Successes in Overcoming Data Reliability Issues***
>
> - Testing smaller sample sets of data well in advance helps to assess that the data is reliable and fit for purpose with respect to the specific ADA objective. (1, 3, 4)

Use of ADAs May Not Always Be Effective

Cash Receipts

- Use of ADAs may not be practicable because of complexities in the way the audited entity's system processes some transactions. For example, there may be many variations in how sales transactions, including cash receipts, are recorded. This results from discounts, returns, the "netting" of various aspects of transactions and batch payment processing. (1)

- The ADA used to map the sales-receivables-receipts process as part of risk assessment was not entirely successful. The engagement team had difficulty in dealing with the many different sources of data related to cash receipts. (2)

Fixed Asset Additions

- When performing the fixed asset addition ADA, the engagement team could not get a proper correlation between additions, WIP and cash payments. The team attributed this to not putting in enough work up front to get a full understanding of the fixed asset accounts. For example, labour costs are an important component of fixed asset additions for this company; this was not taken into account in designing the ADA. Also, the audit of this company did not include performing procedures at an interim date. As a result, problems with this ADA were not identified early enough to develop an appropriate fix. The team's conclusion was that, for this client, the additional time and effort needed to design and perform the ADA significantly exceeded the usefulness of the ADA. They therefore reverted to traditional audit procedures which were easier to perform. They do not plan to use a fixed asset ADA next year. (6)

Purchases, Payables, Payments

- ADAs used to scan various fields in database files related to purchases and payments improved audit quality by providing a better assessment of the overall fraud risk related to segregation of duties. In that regard, they were successful. However, the ADAs:
  - did not replace traditional accounts payable procedures
  - were not directed at detecting material misstatements in accounts payable
  - did not contribute to audit efficiency. (1)

- Completeness of accounts payable is an important assertion. This could not be addressed by using an ADA. Traditional procedures were used for this purpose. (6)

> ### *Successes in Use of ADAs for Purchases, Payables, Payments*
>
> - The engagement team concluded that the purchases-payables-payments ADAs are useful in enhancing the auditor's understanding of transactions and may identify unusual expenses. Use of these ADAs enables the auditor to look at all transactions for the year. (6)

Payroll

- The engagement team does not plan to use an ADA in auditing payroll. Their view is that traditional audit procedures are better suited to the audit of payroll and that use of ADAs would not likely provide useful insights to management. Also, previous audits did not identify significant risks of material misstatement in the payroll or purchases-payables-payments transaction streams. The team wants to focus the use of ADAs on areas of significance such as the risk of fraud related to revenue. Firm-developed ADAs related to the audit of revenue are readily available. The engagement team did not anticipate obtaining very interesting insights from the use of a payroll ADA. (3)

- It is a bit more complex to use two- and three-way matches in auditing payroll because of complexities regarding benefits payable and who receives various payments (e.g., employees, insurance companies, tax authorities, etc.). Because of these complexities, a lower correlation was obtained (i.e., between pay earned and payments received by the employee). However, this result was expected in advance of performing the ADA. (6)

- ADAs are not used to audit payroll since the payroll function is outsourced. A service auditor's report is obtained and tests are performed on inputs and outputs. (8)

Inventory

- For the near term, the engagement team is not thinking of using an ADA to replace other procedures related to the audit of inventory. Over the longer term, there is a potential, for example, to use an ADA to compare costs with net realizable value and to replace some traditional audit procedures regarding inventory valuation. However, the potential value to the audit is limited because the amount of inventory on hand tends to be minimal as the result of the use of a "just-in-time" inventory process. Also, most audit time regarding inventory is spent observing the physical count. It would be most useful to be able to replace inventory counts. However, there is no thought of using ADAs in connection with the count or to replace aspects of it. Further, the inventory ADA provided fewer insights to share with management as compared to the purchases-payables-payments ADA. This is likely because inventory management is a primary focus for management; they spend a lot of time on it, so it is difficult to identify something that management is not already aware of. (1)

- The engagement team wants to use an ADA other than something Excel-based to develop an inventory churn analysis; however, a tool is still needed. Use of an ADA as part of the procedures to audit inventory is difficult. For example, for this client, an ADA cannot be applied meaningfully as at an interim date because levels of inventory vary radically depending on the season. (2)

Three-Way Matches

- In trying to use three-way matches, difficulties such as the following may arise:
  - It may be difficult to address matters such as batch payments, short payments, net payments, penalties for late delivery, discounts for early payment.
  - Applying cash receipts to specific invoices can be a challenging process; cash receipts may relate to transactions other than sales. (1)

- The engagement team does not use ADAs such as two- and three-way matches on this engagement. One reason is that authorizations are often done manually. (8)

Obtaining the Support of Entity Management and the Audit Committee Regarding the Use of ADAs

- The company's audit committee had an unrealistic view regarding use of IT, including use of ADAs. The view was that eventually the audit could be performed automatically at the push of a button and that this would significantly reduce the cost of the audit. This does not reflect reality; the engagement team is trying to prevent/correct these misperceptions. (3)

- Management was worried about possible increases in audit costs. For example, management's use of the firm's project management tool was not successful. It was hard to convince management to provide help in using this tool. Management found it would take too much time and effort to load client data into the tool. However, the tool was still used to track when items were delivered. There may be more potential to use this tool in future audits. The client might be able to send data to the engagement team who would then update the project management tool rather than involve client personnel directly. Working early in the process with management to demonstrate the ease of using this tool in a live setting will assist in future use of the tool. (3)

- The three-way match ADA regarding sales-receivables-receipts needs improvement. There were issues in evaluating the quality of data provided (e.g., completeness). For example, for some sales, there was no corresponding purchase order. Further work showed there was a business reason for this (i.e., some sales contracts were covered by blanket purchase orders for the whole year). The PO field in relevant files was therefore

left blank. Understanding the exceptions in management's process is key to planning ADAs. The result was that evaluating data was much more time consuming than antici-pated. Use of this ADA did not result in any reduction of other substantive work. (3)

Successes in Addressing Concerns of Management and the Audit Committee

- This year the chief financial officer of the client was interested in knowing the results of the ADAs performed since they might have identified issues of which manage-ment was not yet aware. (4)

- Management was alerted up front about the auditor's intention to use ADAs. Man-agement accepted this but were concerned that their staff would perhaps have to do additional work in connection with the audit. However, management found that use of ADAs lessened the support work they needed to provide (e.g., pulling invoices for vouching). Another point to note is that for mid-sized clients such as this one, the auditors discussed the use of ADAs directly with senior management rather than IT personnel. (6)

Suggestions for First-Time Users of ADAs

The participants were asked to provide suggestions to help first-time users of ADAs. Exhibit 2 sets out a roadmap for achieving success in using ADAs that reflects the comments provided. Participants also described matters for auditors to consider in applying each step. These are set out below.

EXHIBIT 2: ROADMAP FOR A SUCCESSFUL TRANSITION TO USE OF ADAs

1.	Establish a supportive environment for experimentation with ADAs.
2.	Be proactive but have realistic expectations regarding the time required to implement ADAs and timelines for successful implementation.
3.	Start small and choose an ADA likely to help improve audit quality.
4.	Ensure the required knowledge and expertise are available.
5.	Understand and communicate clearly to engagement team members all key aspects of the ADA.
6.	Involve client management personnel up front to the extent appropriate.
7.	Start the ADA execution process early and carefully manage the transition from traditional procedures.
8.	Anticipate setbacks and be prepared to respond to them.
9.	Communicate results of the ADA effectively.
10.	Build on experience and share what has been learned.

1. Establish a supportive environment for experimentation with ADAs.

- A firm's national office should provide support free of charge during the period of initial use of ADAs. (1, 3)
- A firm should allow engagement teams to identify potentially useful ADAs and bring those to the attention of the national office to be considered for inclusion in the suite of ADAs and related tools and routines the firm includes in their methodology. (3)

- It is important to have a positive tone-at-the-top regarding use of ADAs. The right environment needs to be established at both the national office and practice office levels. (3, 5, Firm I)

- If tools are developed internationally, national offices of the member network should be able to provide input. (3, Firm I)

- The availability of tools to perform ADAs, integrated with the firm's audit approach, is a key factor in deciding whether to use ADAs or increase their use. A firm may develop its own ADA analytical tools and design them for possible use on all audits. However, the design should also enable the auditor to address specific areas encountered in the particular audit being performed. (5, 6, Firm I)

- Engagement teams need to be given the opportunity and time to work with new tools to promote the use of ADAs. (6)

- An effective approach in pilot testing ADAs is to target engagement teams who share the national office's sense of excitement about increasing the use of ADAs. (Firm I)

2. **Be proactive but have realistic expectations regarding the time required to implement ADAs and timelines for successful implementation.**

   - Do not create unrealistic expectations in the minds of management, the audit committee, or the audit engagement team. (3)

   - First-year hurdles will be encountered whenever you decide to start using ADAs. There is no reason to put off implementation; waiting will just put you behind the rest of the pack. (3)

   - Use of ADAs is a journey. Move at a reasonable pace. (3, 7)

   - Training courses are important, but the real learning happens in the field. The engagement team just has to dive in; start with planning and then execution. Some people may find this a little uncomfortable at first. (6)

   - Although an entity may be relatively small, it may be large enough to enable the effective application of ADAs. (6)

   - The percentage of times an ADA will be successfully performed (i.e., achieve its intended objectives) will increase with experience. Examples of the percentages of times an ADA is likely to be successfully performed, by year of implementation, are as follows:
     — Year 1 – 30%
     — Year 2 – 70%
     — Year 3 – 100% (7)

3. **Start small and choose an ADA likely to help improve audit quality.**

    •   Take care when choosing the type of ADA you plan to use first. For example, three-way matches are often seen as the "low hanging fruit" in developing and applying ADAs. However, they often are not nearly as simple as they seem. For example, trying to match cash receipts to specific invoices can be a challenging process because cash receipts may relate to transactions other than sales or be paid in batches. (1)

    •   It is important to start small and build on the use of ADAs over time. The use of ADAs is not likely to go smoothly in the first year. An ADA to test journal entries may be a useful starting point. Once engagement team members get comfortable with using easier ADAs, they can move on to more complex ADAs such as those used in auditing revenue, receivables and receipts. (3, 4, 6)

    •   Start with high-risk areas or other "meaty areas" where use of ADAs is most likely to improve audit quality. (3, 7)

4. **Ensure the required knowledge and expertise are available.**

    •   It is useful to have national office personnel with knowledge and expertise in ADAs participate in the audit planning meeting to provide input on how the ADA should be implemented. These personnel should have an understanding of IT, ADAs and auditing. Some national offices may decide to not charge for this time in a period of initial adoption of ADAs. (1, 3, 5)

    •   Training and guidance in the use of the audit software and how it is applied in using the planned ADAs is essential. (4)

    •   More junior staff should have some involvement in planning and performing the ADA since they may be expected to take the lead in future engagements. (4)

    •   It is helpful to have the same staff involved in subsequent years since they will be able to build on the knowledge and experience gained in the current year. (4)

    •   A significant amount of IT expertise may not be needed to perform the ADA (e.g., for smaller audits when the systems and data are less complex). (4)

5. **Understand and communicate clearly to engagement team members all key aspects of the ADA.**
    Key aspects of the ADA include:

    •   how the appropriateness of the data for the purposes of the ADA will be determined (e.g., its completeness and accuracy and the usability of the data format). It is good to get comfortable early on with how to obtain data from the client and cleanse it for audit use. (1, 6)

    •   tools (e.g., software applications) to be used. Based on the circumstances of each audit, local offices decide whether to use the tools provided by the national office as-is, to customize the tools provided, or to create their own tools. (3)

- how, when and by whom the data will be obtained:
  - The engagement team members or auditor's experts need to understand management's processes to be able to customize the tools available to the particular circumstances. This takes time. (3)
  - Use data obtained at the source level (i.e., from the tables or files from which management reports were generated, not from the reports themselves). (7)
  - In up-front planning, consider matters such as how to obtain large volumes of data (e.g., perhaps obtain the data monthly or quarterly). Also consider how to deal with complex data (e.g., perhaps divide the data into more homogeneous sub-populations). (4, 5)
- expected outcomes. Auditors need to understand the entity's accounts, transactions, and processes to be able to determine, for example, what correlations to expect among the resulting account balances. (6, 7)
- specific audit objectives to be achieved (7)
- relevant data required. (7, Firm B)

6. **Involve client management personnel up front to the extent appropriate.**[8]
   - It is important to set the right tone with the client's top-level management. We need their support in allowing and encouraging access to IT personnel and others with whom we may not normally engage. (3)
   - Ideally, there will be a "champion" on the financial management side who has IT and data analysis skills and who understands what the auditors are required to do. (1)
   - The client's accounting and finance personnel as well as IT personnel should be involved. Discussing matters with only finance personnel or only IT personnel will not work. (1, 5)

7. **Start the ADA execution process early and carefully manage the transition from traditional procedures.**
   - Start early in the audit. If possible, do not start using ADAs at year end. Starting early enables you to address issues before facing year end timing deadlines. Get in the habit of helping clients provide data to you in the right format and at the right time (i.e., early). Also consider running the ADA in parallel with traditional procedures for at least one year. (1, 3, 4)
   - Make sure the data is understood prior to doing the work (i.e., understanding the source of data, structure, and meaning of the data). This might be done by examining a smaller subset of the data as a sample. (5)

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8   The discussion with a senior member of financial management of one of the audited entities strongly supported the need for timely discussions with both IT and finance staff to help ensure effective and efficient co-operation and co-ordination.

- Do a dry run of the ADA with a small sample of data (e.g., one month) and ask pertinent questions before applying the ADA to the whole population of data to be analyzed. It is important to test the use of an ADA up front to help ensure the ADA will succeed. (1, 6)

- Make inquiries regarding system changes that have occurred since the end of last year's audit or are planned to take place in the short term. This includes system changes related to new acquisitions by the audited entity. This may have a signifi-cant adverse effect on the auditor's ability to use ADAs effectively. (6)

- Discussions with management regarding use of ADAs should be held at least 90 days before the audit commences. (7)

- Consider the additional time that may be required when client personnel do not have an in-depth understanding of how the current software works or of the nature and extent of the effects of planned system changes. (7)

- Consider the complexities that may arise if the use of the ADA will involve accessing both new and legacy systems. (7)

8. **Anticipate setbacks and be prepared to respond to them.**

- Plan for setbacks. There will be obstacles regarding the quality of data initially obtained, understanding the data and the related time it takes to implement the ADA properly. (1)

- There should be open communication between the auditor, management and the audit committee throughout the audit to discuss issues encountered. (3)

- There will often be issues to address regarding the dates and times at which data is obtained. One key factor to address is whether the data used in an ADA accurately and completely reflects the data underlying transactions recorded in the GL. The client's system will continue to generate transactions and adjustments affecting the GL. Therefore, the auditor may have obtained, for example, a trial balance as at a specified date, but transactions can continue to be posted. Therefore, the auditor has to be aware of the need to reconcile the GL trial balance obtained with the final client GL because of issues related to the timing of postings. The best approach is to obtain the trial balance as at an appropriate date and then obtain and determine the nature and extent of transactions posted subsequently. (5, 7)

- In the first year of application, significant time will be required to carry out the steps noted in 2 to 6 above. Set realistic timelines and milestones; recognize that some delays are inevitable. Effective project management is vital. (7)

9. **Communicate results of the ADA effectively.**

- Use of effective visualization is important in telling client management the story of what the ADA revealed. (7)

10. **Build on experience and share what has been learned.**

   • Going forward, subsequent use of ADAs is likely to be significantly less difficult because of the knowledge obtained about how the entity's particular ERP system works. Year-over-year comparisons may be more practicable. (4, 7)

Use of ADAs in Future Audits

As described earlier in this report, the participants in this initiative shared their experiences of engagements executing ADAs in the first or second year. There are other engagements at some of the participating firms that are currently applying more complex ADAs. As part of this initiative, we discussed challenges that remain, use of ADAs in the future and the ability to apply them more substantially as auditors move further along their journey in applying ADAs.

Recognition That Significant Challenges Remain

Use of ADAs As Substantive Procedures

- Data reliability is a large hurdle in moving to use ADAs as substantive procedures. For example, as a result of more hours being required or other potential conflicts, the engagement team may determine that the costs of extra work may far outweigh any benefits. (1)

- An overall objective is to expand the use of ADAs beyond risk assessment. However, there is still a lot to learn about the viability of such an approach. The engagement team will still focus on risk assessment for revenue. This focus provides more value each year, since results from previous years provide a useful basis for comparison, taking into account the growth of revenue. In addition, the team may start using some ADAs in assessing risks of misstatement related to inventory. However, moving to use of ADAs as substantive procedures will be difficult because of the risk of being challenged by audit regulators regarding the reliability of source data. (2)

- ADAs are currently used as a supplement to other audit work but will eventually replace other standard audit procedures. (4)

- In previous years, audit regulators have expressed concerns about the proper design and performance of ADAs as substantive procedures. (9)

Need for Changes in Auditing Standards and Support from Audit Regulators

- Decisions to use ADAs as substantive procedures will likely require a firm-wide change in audit methodology supported by changes in auditing standards and buy-in from audit regulators. (1)

- Audit regulators are curious and supportive of the firm's use of ADAs. The firm has shared their ADA methodology and tools with audit regulators and is open to input and feedback regarding the use of ADAs for performance of risk assessments and as substantive procedures. It would be beneficial for regulators to express their views on whether what has been presented to them is, in their view, sufficient and appropriate audit evidence. Understanding that views change and what is appropriate today may not be appropriate in the future (especially with the pace of change of technology impacting the use of ADAs), this type of conversation and support from regulators would be helpful in advancing the use of ADAs. (Firm A)

- Engagement teams are not afraid of using ADAs to identify and assess risks of material misstatement. However, questions still arise regarding how much assurance can be obtained when using ADAs, for example, to perform substantive analytical procedures. Because there is considerable professional judgment involved, auditors are unsure. Auditors would prefer to have guidance in standards regarding what level of assurance can be provided. (Firm I)

- A key issue is that auditing standards neither define ADAs nor provide guidance on their use. For example, it is not clear how ADAs fit specifically into the various types of procedures in standards (i.e., risk assessment procedures, tests of controls, substantive analytical procedures and substantive tests of details). It is also not clear, for example, how ADAs can be used in testing the operating effectiveness of controls (i.e., what can the auditor infer from the results of performing the ADA). (Firm I)

- Some members of the firm were of the view that more advanced ADAs could be used at least by some of the member firms in the global network. Such use appears to be infrequent. This may be because their use is difficult given auditing standards. For example:
  — Standards contain only a few references to the use of CAATs and do not address the use of ADAs at all.
  — Free-form tools can be difficult to apply within the context of the auditing standards. Under CAS 520, for example, the auditor is required to develop a sufficiently precise expectation. That can be difficult both to define and achieve. With free-form tools, auditors cannot reliably measure the precision of their estimate. (Firm I)

Difficult to Improve Audit Efficiency

- Although the primary focus is on improving audit quality, eventually audit efficiency may also be improved but likely only after two years' experience in using ADAs. However, since there are changes at the client and in the technology, investment in our ADA tools will continue to be significant. (3)

- It will be challenging to make ADAs useful in auditing revenue when the revenue recognition process is complicated (e.g., where a sale is comprised of multiple performance obligations). However, in cases where there are no accounting complexities regarding revenue recognition, there may be potential to use a three-way match ADA to replace vouching of a sample of sales transactions. (5)

- More time and more effective audit software applications will be needed before ADAs can replace traditional audit procedures. However, every year, the set-up time will be reduced so there can be more time spent with the reports generated from the ADAs. (5)

- The emphasis is on improved audit quality resulting from the greater insights and understanding of the entity that ADAs provide. The auditor can demonstrate this greater understanding to the audit committee. The result is that audit quality will be improved both in fact and perception. (6)

- Using an exploratory model helps the auditor to identify high-risk areas and allows for the use of professional judgment. However, items not identified as high risk cannot be ignored. Therefore, the use of ADAs is incremental (i.e., they are add-ons to existing procedures). As long as this factor remains, engagement teams will be hesitant to make more use of ADAs. There is a need to move toward a better model. (Firm I)

Increased Use of More Advanced Analytics May Be Difficult

- ADAs do not currently involve the use of external data (i.e., data generated outside the company), such as Big Data, mainly due to financial constraints. More use of predictive analytics will likely be made in the future. These analytics will likely involve the use of external data, including Big Data. (2, 6)

- Some auditors in member firms are using process mining. However, its use in the consulting arm of the firm is more common. Process mining has limited use in an audit context since it does not provide evidence regarding whether controls are working effectively. Process mining may be useful in obtaining an understanding of how a process works but would be an add-on to existing procedures. (Firm I)

Little Use of Analytics by Financial Management of Audited Entities

- Client management is considering looking at Robotic Process Automation (RPA) solutions to try to limit the ever-growing head count needed to process growing volumes of data. Within the company, management currently uses analytics to support retail/marketing decisions but they are not of direct relevance to the audit. Analytics are not currently being used to help manage other aspects of the business. But that may change in the future. For example, the company has started a process under which

all documents along the supply chain will be scanned. This will result in digitized data being more readily available for analytics. Also, the finance function is automating more aspects of processing the various transaction cycles. (2)

• Management does not make use of analytics in developing and using its key performance indicators or in benchmarking against similar operations and does not appear to have plans to do so. (1, 2, 3, 4)

ADAs May Not Be Effective for Some Assertions

• There is potential for future improvements in addressing the accuracy assertion related to revenue, accounts receivable and cash receipts. However, in the view of the engagement team, an ADA will never be developed that will effectively address the completeness of revenue. (1)

Planned Changes to Address Challenges

Comprehensive Review of Use of ADAs, Including Potential Use in Testing Controls

• The engagement team has a three-year plan for implementing ADAs and they plan to stick to it. The overarching aim is to make improvements in the use of ADAs year over year. The plan is general in nature rather than overly detailed. It includes consideration of all the tools the firm has available and has evaluated. The engagement team will identify which of those are most likely to work for this particular audit engagement. For example, there are tools available related to the audit of accounts receivable, inventories, property, plant and equipment and payroll that are likely to be effective. Other aspects of the plan include the following:

— The engagement team is looking to replace some traditional substantive procedures with three-way matches.

— They will extract journal entry data during the year rather than wait until year end.

— For all ADAs, they plan to start in Q1 to work out any kinks with data so there will be no problems later on. This will enable them to address issues before facing the tight time constraints surrounding the work done at year end.

— Improvements will continue to be made in the revenue ADA, taking into account experience gained in the preceding two years.

— They will continue to work with the firm's ADA experts to see how to better implement ADAs, and then determine which ADAs are reasonable to implement on a year-over-year basis. (3)

More Use of ADAs in Planning and Performing the Multi-Location Aspects of the Audit

- The engagement team will look at expanding its use of ADAs to help determine the nature, timing and extent of work to be done at various locations. For example, they will identify those locations for which it would be appropriate to perform only limited audit procedures. These would not replace existing procedures but would help strengthen the scoping analysis. Use of ADAs could help reduce the number of "in-scope locations" (i.e., those that will be the primary focus of audit procedures). (1)

- The engagement team will consider applying the ADAs being used now to more locations and will further develop use of ADAs over the next three to five years. This process will include brainstorming to clarify the ultimate goals for using ADAs. This process will entail, for example:
  - further consideration of where ADAs can replace traditional audit procedures, including going beyond risk assessment. For example, there may be merit in using an ADA to identify negative margins.
  - more specifically addressing data reliability issues, including the reliability of information produced by the entity (IPE). Many questions still remain.
  - engagement team members having dialogue with the firm's audit methodology personnel to identify those aspects of the audit the team believes would benefit from more use of ADAs. (1)

More Use of Monthly Data

- The engagement team will refine the data needed to perform the ADAs. For example, they will obtain a sample to see whether a three-way match can be applied in assessing risks regarding sales, receivables and receipts. The timing of the application of the ADAs needs to be adjusted to get the data ready for use. The team will determine whether monthly runs can be performed and develop a routine so that application of ADAs is not left until the end of the year. It is helpful that company management is now building analytics into its own internal routines. The engagement team recognizes that receiving timely co-operation from IT is not as easy as pushing a button. IT is a scarce resource for the audited entity. To obtain timely co-operation, the engagement team may need to show the procedures being performed with monthly data are beneficial to both management and the auditor. (1)

Other Possible Expanded Uses of ADAs Being Considered

- The firm has added other audit programs with procedures to follow when using ADAs. To be more beneficial, ADAs need to cover more areas of the audit. ADAs are becoming progressively more of an integral part of the audit and a primary source of evidence. (4)

- With assistance from national office representatives, the engagement team intends to "bake ADAs into the audit program" for this engagement. Future audits will likely include use of operational data as well as financial data. However, this will require dialogue with the client as they have not previously made requests to obtain non-financial data. Going forward, engagement teams may be in a position to take more credit from the performance of ADAs as a source of audit evidence. (5)

- Now having had two years' experience using ADAs, the engagement team plans to further reduce the extent of traditional substantive testing of revenue transactions by increased use of ADAs. However, they do not plan to reduce the extent of testing of accounts receivable from that performed this year. (6)

- Right now, ADAs focused on the audit of revenue, receivables and receipts are likely to be more useful than those used in auditing other transaction streams. However, as use of ADAs evolves, the usefulness of ADAs for other transaction streams will improve. For example, more might be done regarding completeness of accounts payable through an analysis of suppliers over the year. (6)

- Globally, the firm is very committed to making more use of ADAs. The expectation regarding use of ADAs is not going away:
  — The firm has published a data analytics guide as well as a variety of tools ranging from simple to more complex. There is optimism that as more people get comfortable with the tools and guidance (and the guidance is continuously updated), it will become second nature.
  — The use of ADAs is being embedded into the training curriculum.
  — Teams are becoming more and more aware of how to use ADAs. (Firm B)

- The future will involve performing financial statement audits in a different way. Assurance services will be expanded to address subject matter information beyond traditional financial statements such as non-financial performance measures and integrated audits. Audits might also be continuous. For example, the auditor might provide continuous assurance on specific data on an entity's website in real time. Assurance engagements might also focus on the processes, including controls, used to produce various types of information. The focus could be cybersecurity. Technology has changed so much over the past five to 10 years. Dashboards can be used to look at everything and identify the anomalies. (Firm I)

Leveraging Knowledge on a Firm-Wide Basis

- Future use of ADAs is likely to be significantly less difficult because of the knowledge obtained about the entity's ERP system. It would be useful if a firm could leverage the knowledge obtained of how variations of systems work by having a database (without identifying specific clients) so that other engagement teams encountering similar systems could benefit from such knowledge and not have to reinvent the wheel each time similar issues are encountered. (7)

Conclusion

This initiative focused on engagement teams that have started using ADAs and were willing to share their insights in order to encourage other auditors to start using ADAs or to continue enhancing their use. The comments of the participants provide a useful snapshot of both the challenges faced by auditors in initially adopting ADAs, some successes they have achieved to date and their commitment to continue expanding their use. Other CPA Canada initiatives, such as the survey regarding use of ADAs referred to earlier in this report, indicate some auditors have already moved ahead and are using more complex, statistically based ADAs. Regardless of the stage to which various engagement teams have progressed in using ADAs, input shows they have strong support from their respective firms. For example, many larger firms continue to make significant investments in both technology and the development of training and other forms of guidance. These efforts reflect a view that use of ADAs will be a key factor in enhancing the relevance and value of the financial statement audit and in continuing to improve audit quality.

Call to Action

Auditors, regardless of their firm size, are encouraged to:

- continue learning about ADAs

- ensure they (or their relevant team members) have the appropriate skills/training to execute ADAs in their audits

- start using ADAs in their audit engagements today (if they are not already doing so) and/or continue to push the boundaries by exploring new ways of using ADAs

- identify and speak up about challenges encountered when using ADAs in the financial statement audit.

We hope auditors found the results of this initiative insightful and can learn from others' experiences, including the challenges and success stories shared along the way. CPA Canada will continue to monitor developments in this area internationally, including any potential impact on auditing standards.

CPA Canada and its ADA Committee will take the results of this initiative into account in deciding on the nature, timing and extent of future projects and communications to help support increased use of ADAs. We encourage you to reach out to CPA Canada with any suggestions or concerns you may have on this matter, so we can work together as a profession to help further the implementation of ADAs.

Other Resources

CPA Canada Guide to Audit Data Analytics is a non-authoritative guide collaboratively produced with the AICPA and adapted for Canadian standards. This guide provides an introduction and overview of ADA techniques to help financial statement auditors apply such techniques when performing their audit engagements.

CPA Canada is committed to supporting its members through tools and resources to promote awareness, understanding and effective implementation of data analytics. Please visit www.cpacanada.ca/DataAnalyticsInAudit for all other resources related to this matter.

Comments

Comments and questions on this report or suggestions for future ADA initiatives should be sent to:

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Appendix—Process Followed in Undertaking This Project

Project Design

CPA Canada prepared a document to provide potential participants with significant information regarding the project. It included matters set out below.

Selection of Participants

- CPA Canada staff solicited firms to participate in the project.

- Each participating accounting firm determined the audit engagements through which it would participate in the project.

- A criterion for selecting engagements was that the audits have not previously used an extensive number of ADAs (i.e., the audits were in their first or second year using ADAs).

- Audit engagements were completed in 2017 or 2018.

Safeguards to Maintain Confidentiality

- Safeguards were implemented to maintain confidentiality. For example, the names of the clients whose financial statements were audited are not revealed in the report and the participating firms are not linked to the comments made throughout the report.

Engagement Team Control over the ADAs Performed

- CPA Canada did not provide any specifications or other input regarding the nature, timing or extent of ADAs to be used.

Format and Content of Interviews

- Participants in the project were provided a list of questions in advance that would be asked by CPA Canada. The types of topic that could be covered in interviews are set out below. However, not all topics were addressed in each interview.

Topics for Interviews in Early Stages of the Audit

The main topics for interviews conducted in the early stages of the audit for the particular engagement included the following:

- overall aspects of this audit that will involve the use of ADAs (e.g., risk assessments, tests of controls, substantive procedures)

- nature and extent of the engagement team's previous experience, if any, in using ADAs in the audit of this entity

- significant changes planned in the use of ADAs compared to audits in previous years

- perceived overall potential benefits of using ADAs in performing this audit

- anticipated effect of the use of ADAs on audit costs/hours

- types of ADAs the engagement team plans to use and the reasons for their use

- software/tools to be used in performing the ADAs

- levels of knowledge/expertise of the members of the engagement team or experts who will be planning, performing and evaluating the ADAs

- major challenges anticipated, if any, regarding the use of the planned ADAs

- nature and timing of discussions of planned use of ADAs with client management and reactions of management

- nature and timing of discussions of planned use of ADAs with the client's audit committee and reactions of committee members.

Topics Covered in Post-Audit Interviews

For post-audit interviews, the main topics included the following:

Implementation of Planned ADAs

- Were there challenges to implementing ADAs into any of the planned areas? What were the challenges (e.g., compliance with CASs, data acquisition, data integrity etc.) and were they overcome? Why or why not? Where did you plan to use ADAs but were unable to?

- Which ADA(s) were most successful? Why do you consider them successful?

- Which ADA(s) did not work as planned? Why not?

- Were you able to perform the ADAs in the time allotted in the budget? If not, what caused additional time/costs to be spent?

- Which ADA(s) were easy to implement? Why?

- Which ADA(s) were most difficult to execute? Why?

- Were there alternative procedures you needed to perform? Why? How did this impact your audit plan?

- What audit documentation best practices did the firm adopt?

- Did you obtain sufficient appropriate audit evidence for the ADAs implemented? Why or why not?

- Were other traditional audit procedures replaced by the use of ADAs?

- What were the main findings/learnings in the following areas:
  - risk assessment procedures
  - tests of controls
  - substantive analytical procedures
  - tests of details
  - procedures to help form an overall conclusion.

- How did the use of ADAs impact:
  - the budget for the audit
  - recoverability
  - allocation of staff (junior vs. senior staff)?

Data Acquisition

- How much time was spent gathering data (both in hours and percentage of time on the ADAs)?

- Who was involved from the client side in gathering the data?

- How many times did the auditor have to go back and forth when gathering the data?
  - What requests did the client misunderstand?
  - What would you do differently to ensure the client sends the right data?

- How did the audit team verify and document the data extracted was complete and accurate?

- Did management have issues or challenges with the requests made by the auditor about data?

Benefits of Using ADAs

- Were any insights obtained through the use of ADAs that changed your original audit plan? Do you have any examples you could share?

- What were the benefits of the ADA results to the engagement team? For example:
  - How did this improve client relationships (i.e., did the client feel the work yielded valuable insights beyond the actual analytic in terms of system controls and process improvements)? In what ways?
  - What audit insights were achieved that could not have been achieved without the use of ADAs?
  - Do visualizations help tell the story better? How?
  - Did this lead to any extra work in terms of future engagements?
  - Did the audit team extra-bill for client delays related to delivering data, etc.?
  - What were the indirect benefits of the use of ADAs on the audit? What other areas of the audit were better understood or examined because the auditor was working this area? For example, were you able to better target journal entry testing or exclude areas because you had tested them via the ADAs? Did the team identify a specified error that required you to reassess risk in a specific area or for the whole audit, etc.?

- What insights about the entity were noted from running ADAs that had not been noted previously in other years' audits with no ADAs?

- Did management benefit from the insights from the ADAs? In what ways?

Skillsets and Training

- Were any specialists involved in executing ADAs? What particular skill was needed?

- Did staff identify any training needs?

Audit Committee Impact

- What were the benefits to the audit committee?

- Did the audit committee benefit from the insights from the ADAs? In what ways?

- What questions did the audit committee ask about ADAs use on the audit?

- What level of reporting, regarding ADAs, was provided to the audit committee?

- What was the audit committee's interest regarding ADAs?

Overall

- What have been the key learnings from the ADAs used on this engagement?

- What would you do differently?

- What will you do differently next year?

- Are there any specific requirements within the CASs that were a challenge to comply with when integrating ADAs?

- Did the auditor encounter any challenges related to management? What were these challenges? How did you overcome them?

Other

- Is there anything else relevant to the project about which you wish to inform CPA Canada?

- Did management have any concerns/issues with confidentiality? What controls did they require the auditor to put in place before granting access to the data?

- Did the audit regulator review the ADAs executed on this audit? Was there any feedback?

- What advice would you give to an audit team hoping to use ADAs on an engagement for the first time?